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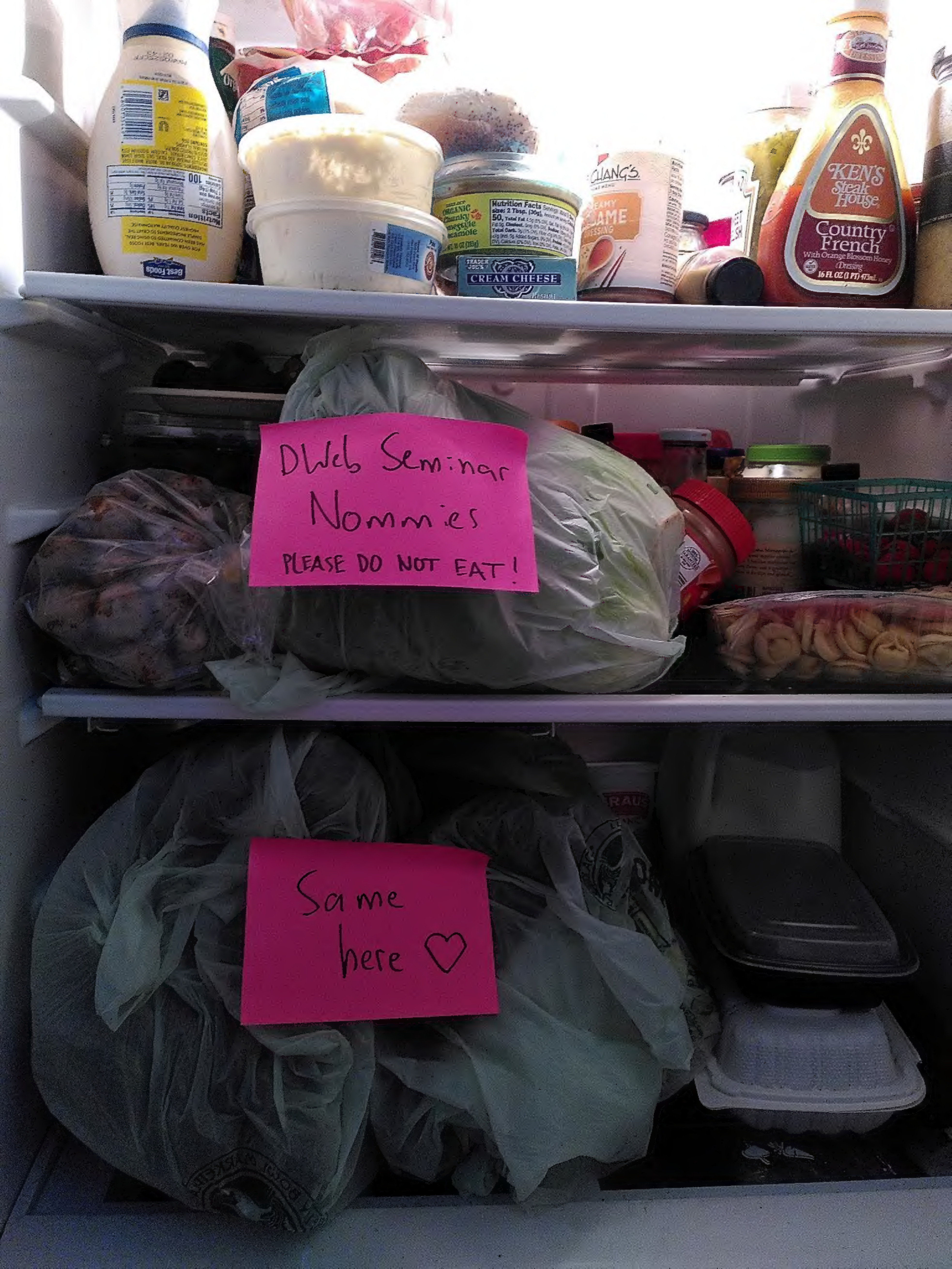
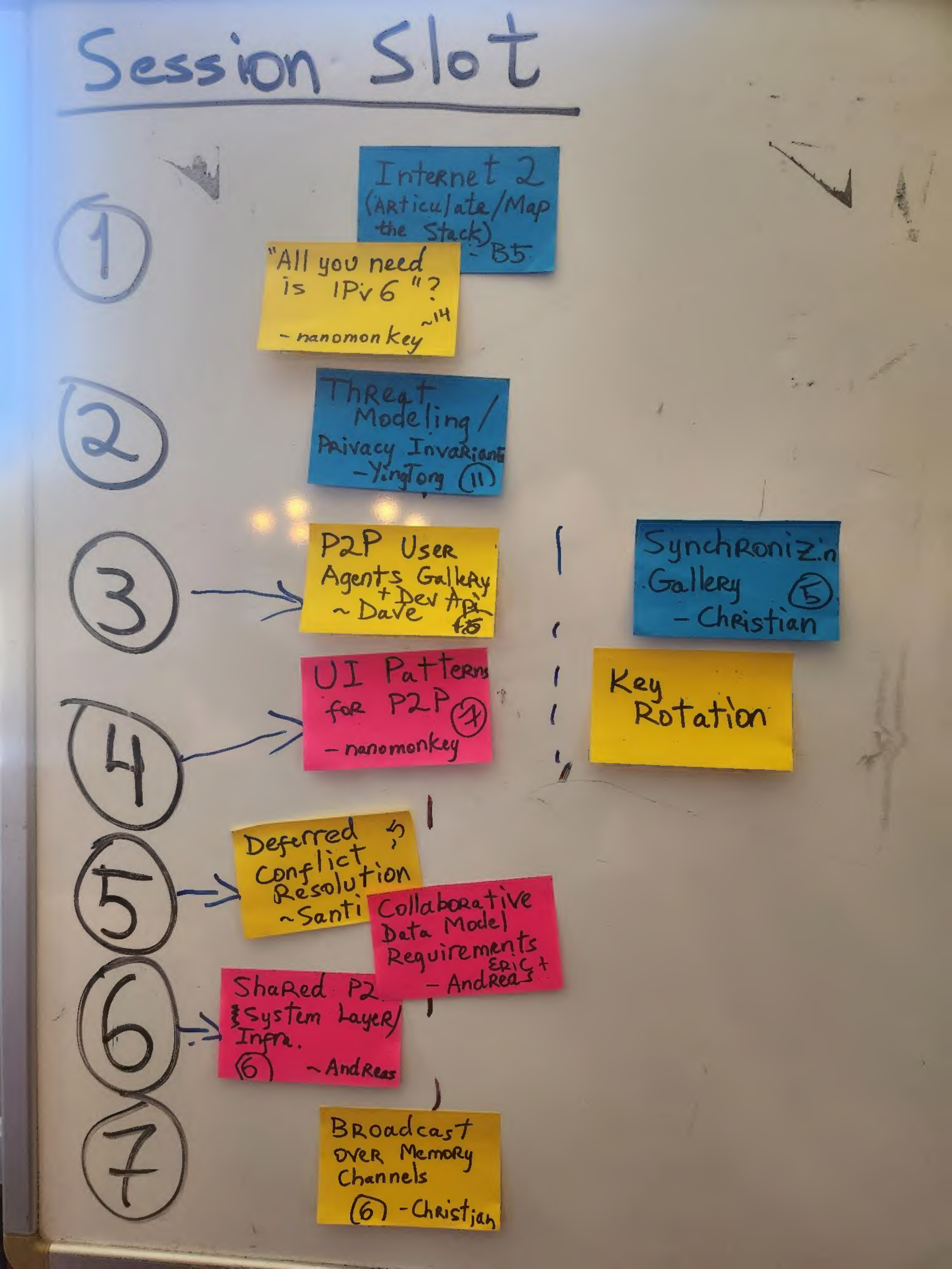

DWeb Seminar
Nommies
PLEASE DO NOT EAT!
Same
here ♡
CREAM CHEESE
KEN'S Steak House
Country French
With Orange Blossom Honey Dressing
16 FL OZ (1 PT) 473mL
Best Foods
CHANG'S



Session Slot

①

Internet 2
(Articulate/Map
the Stack)
- B5

"All you need
is IPv6"?
~14
- nanomonkey

②

Threat
Modeling /
Privacy Invariants
-YingTong (11)

③ →

P2P User
Agents Gallery
+ Dev Api
~ Dave
+5

Synchroniz'n
Gallery (5)
- Christian

④ →

UI Patterns
for P2P (7)
- nanomonkey

Key
Rotation

⑤ →

Deferred
Conflict
Resolution
~Santi

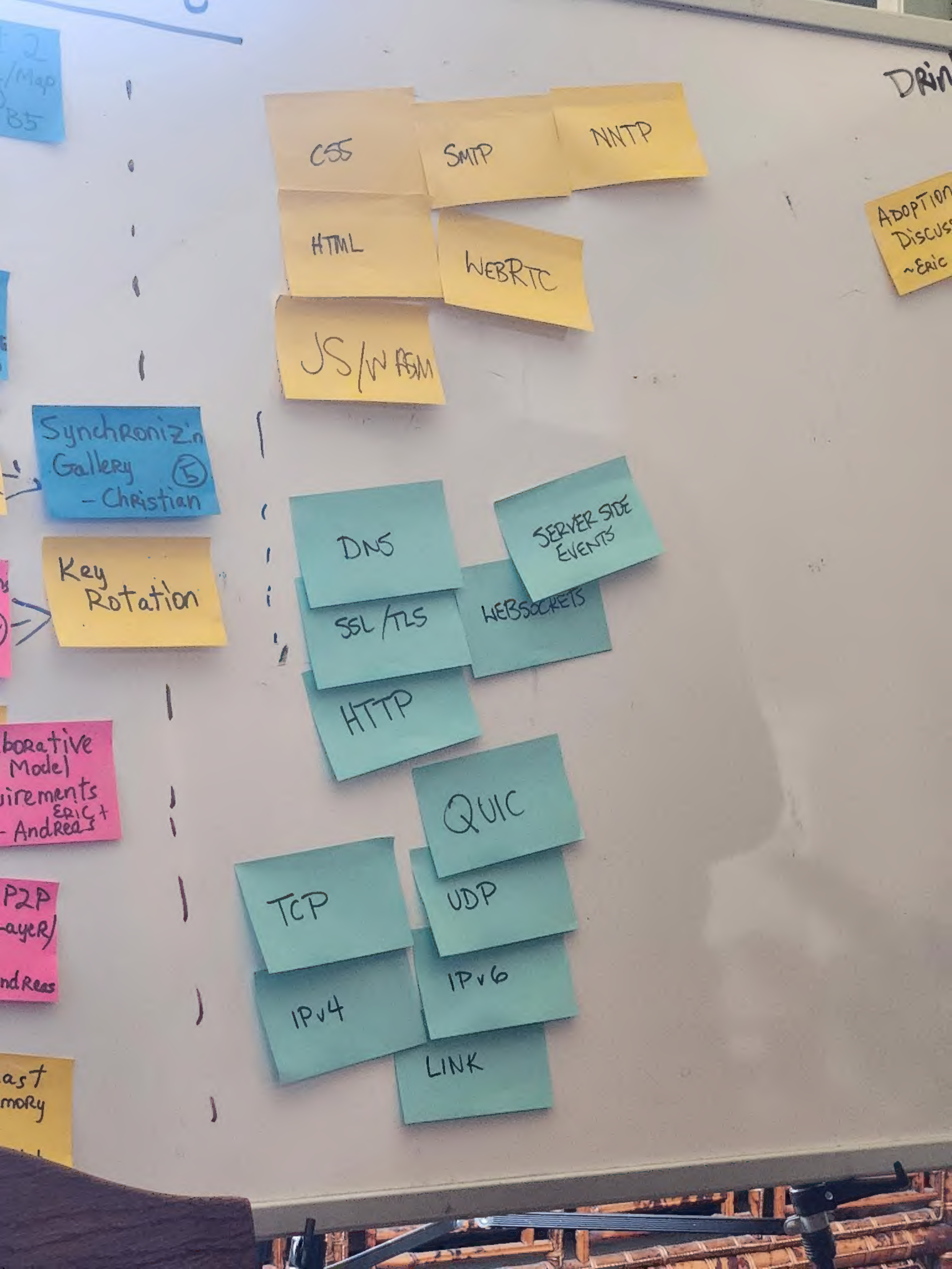
Collaborative
Data Model
Requirements
- Eric +
Andreas

⑥ →

Shared P2P
System Layer/
Infra.
(6) ~Andreas

⑦

Broadcast
over Memory
Channels
(6) - Christian



t 2
/Map
B5

Synchronizin
Gallery ⑤
- Christian

Key
Rotation

borative
Model
uirements
- Andreas Eric +

P2P
ayer/
ndReas

ast
mory

CSS

SMTP

NNTP

HTML

WEBRTC

JS/WASM

DNS

SERVER SIDE EVENTS

SSL/TLS

WEBSOCKETS

HTTP

QUIC

TCP

UDP

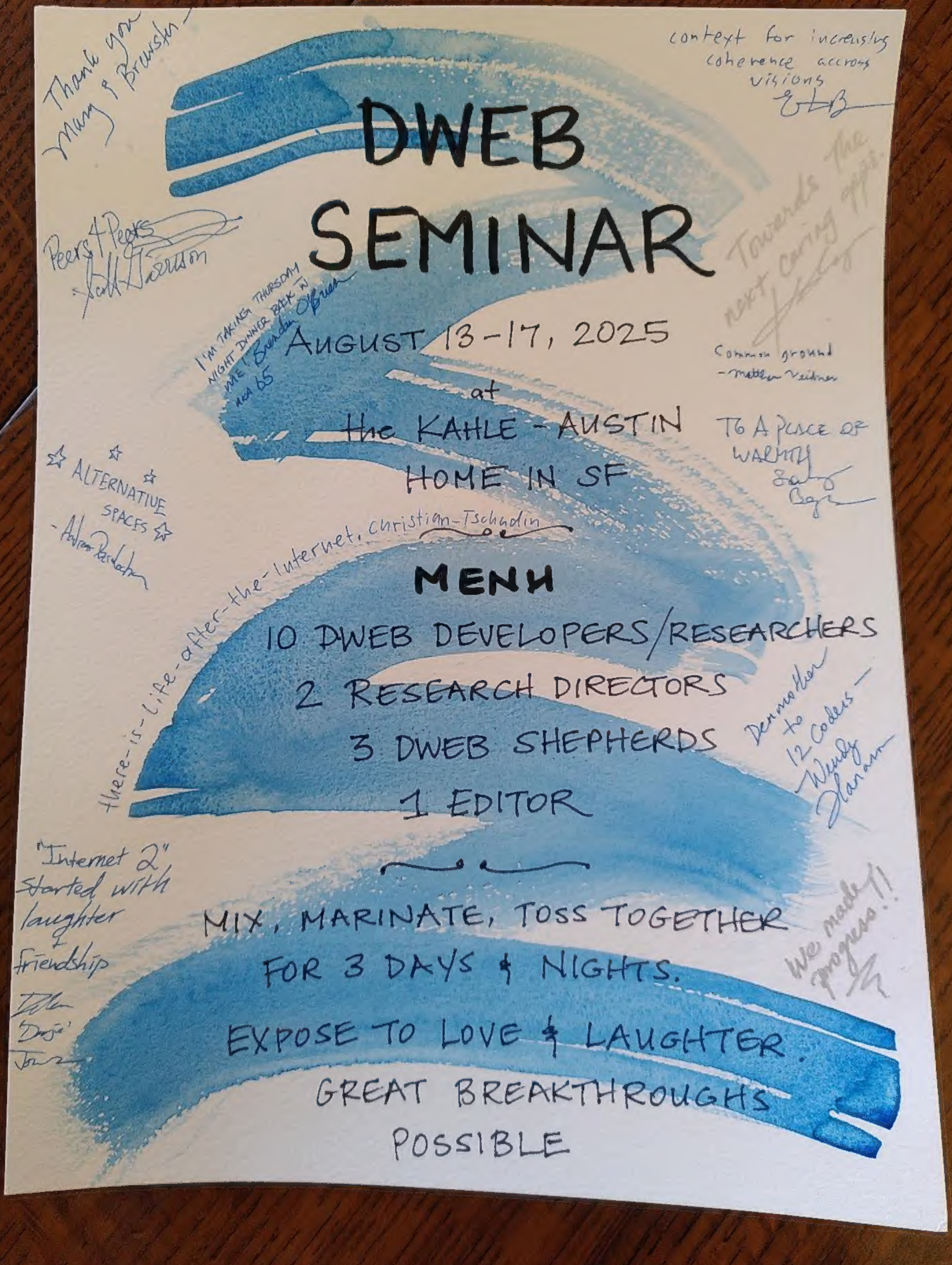
IPv6

IPv4

LINK

Drin

Adoption
Discuss
~Eric



Thank you Mary & Brewster —

context for increasing coherence accross visions
EtB

DWEB SEMINAR

Peers 4 Peers
Scott Garrison

Towards the next caring apps.

I'M TAKING THURSDAY NIGHT DINNER BACK W ME! Brendan O'Brien AKA 65

AUGUST 13-17, 2025

Common ground
- Matthew Weidner

at

~~the~~ KAHLE - AUSTIN
HOME IN SF

TO A PLACE OF WARMTH
Sandy Boyer

☆ ☆ ☆ ALTERNATIVE SPACES ☆
- Adrian

there-is-life-after-the-Internet. christian-Tschudin

MENU

10 DWEB DEVELOPERS/RESEARCHERS
2 RESEARCH DIRECTORS
3 DWEB SHEPHERDS
1 EDITOR

Denmother to 12 Coders — Wendy Hanamura

"Internet 2" started with laughter & friendship
Dylan "Dojo" Jones

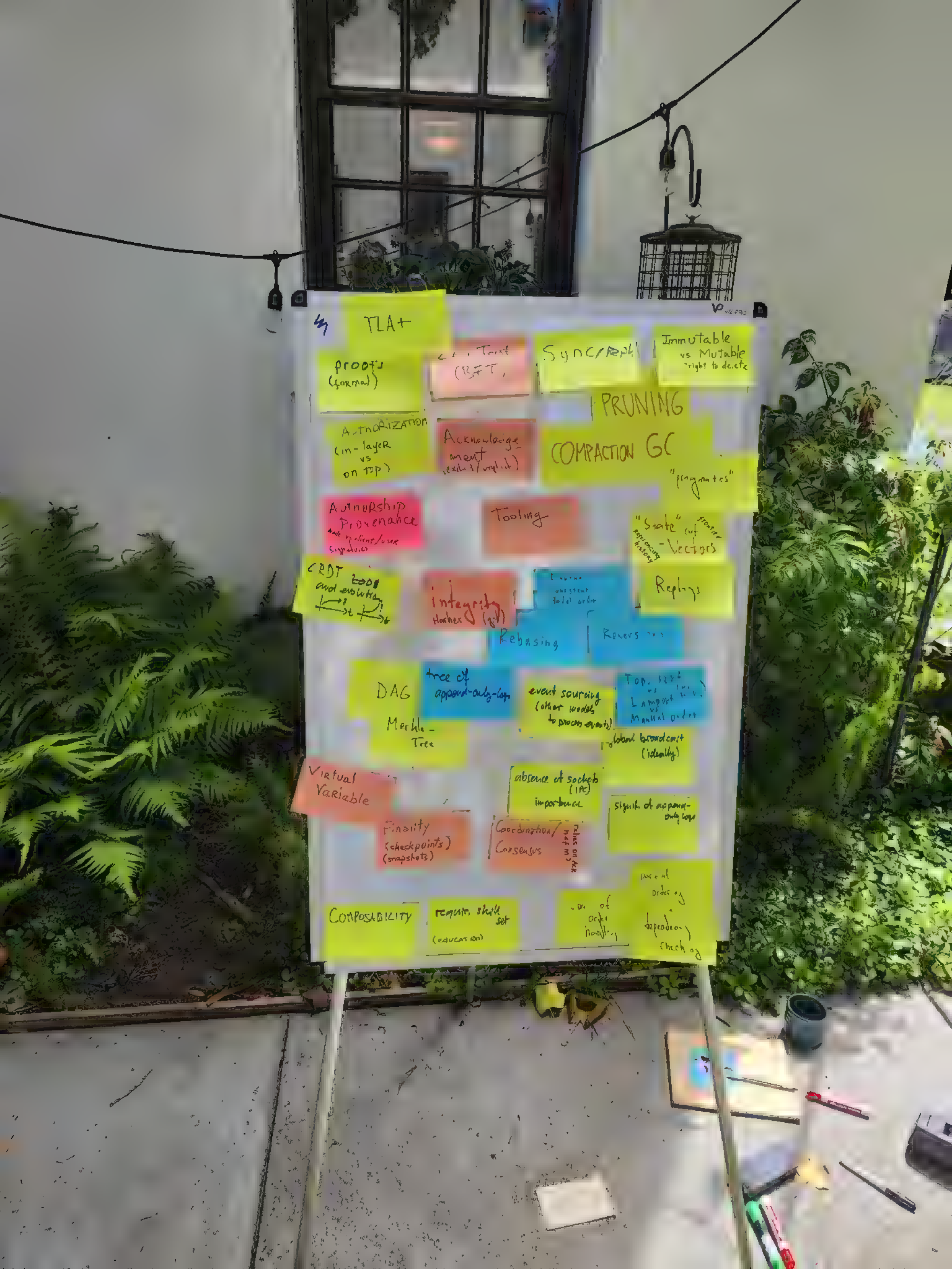
We made progress!!

MIX, MARINATE, TOSS TOGETHER
FOR 3 DAYS & NIGHTS.

EXPOSE TO LOVE & LAUGHTER.

GREAT BREAKTHROUGHS
POSSIBLE

CP


TLA+
proofs (formal)
Trust (BFT,
Sync/Repl
Immutable vs Mutable "right to delete"
PRUNING
COMPACTION GC
"pragmates"
AUTHORIZATION (in-layer vs on top)
Acknowledgement (explicit/implicit)
Authorship Provenance
Node vs client/user
Signatures
Tooling
"State" cut frontier
referencing history
-Vectors
CRDT ~~tool~~ and evolution
integrity
Hashes (git)
consistent total order
Replays
Rebasing
Revers
DAG
tree of append-only-logs
event sourcing (other models to process events)
Top. sort vs Lamport vs Manual order
Merkle-Tree
global broadcast (ideally)
Virtual Variable
absence of sockets (IPC) importance
signif. of append-only logs
Finality (checkpoints) (snapshots)
Coordination/ Consensus
relies on Ack
partial ordering
dependency checking
COMPOSABILITY
requir. skill set (education)
of order handling

Cheese

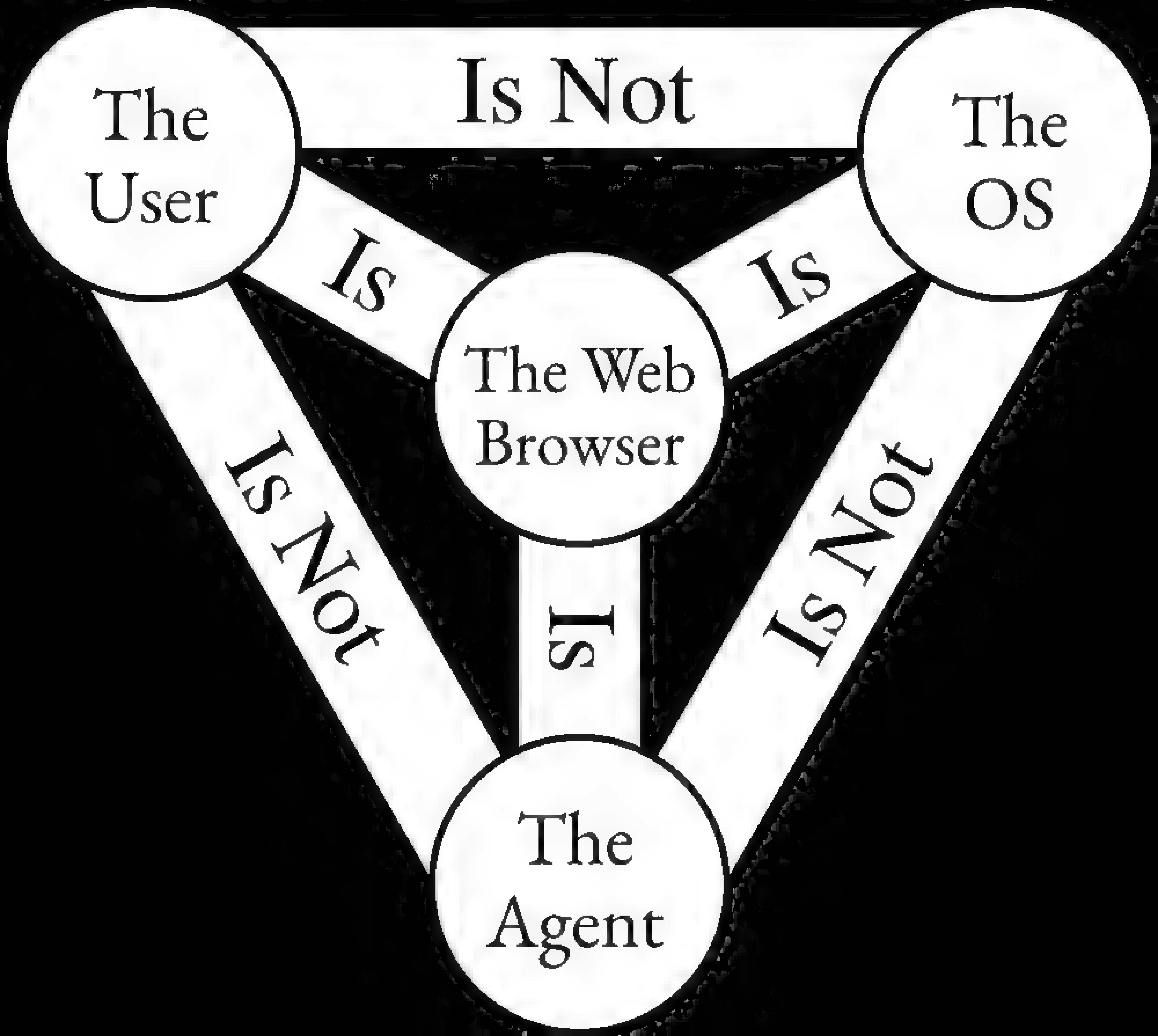
(Materialized State)
(Filtered DAG)
(DAG)
(AO Logs)
TLA+
proofs
AUTHORIZATION
A Provenance
DAG:
Merkle Tree
tree of append-only-logs
event sourcing
FORKED LOGS
checkpoints (snapshots)
COMPOSABILITY

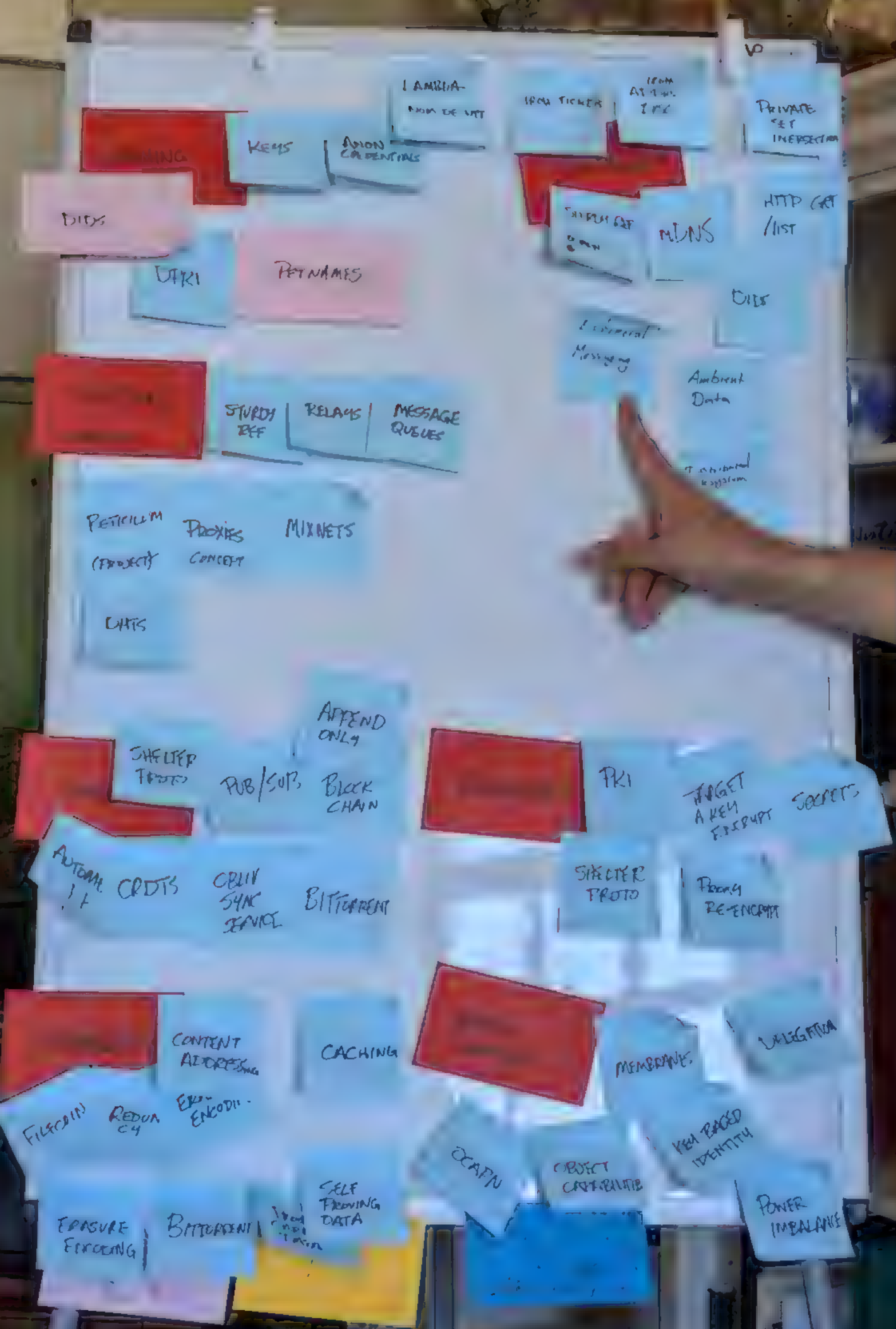
Materialized State
Filtered DAG
DAG
AO Logs
TLA+
Authorization layer on top
Provenance
tree of append-only-logs
DAG
Merkle Tree
event sourcing
FORKED LOGS
checkpoints (snapshots)
COMPOSABILITY

alt schoo

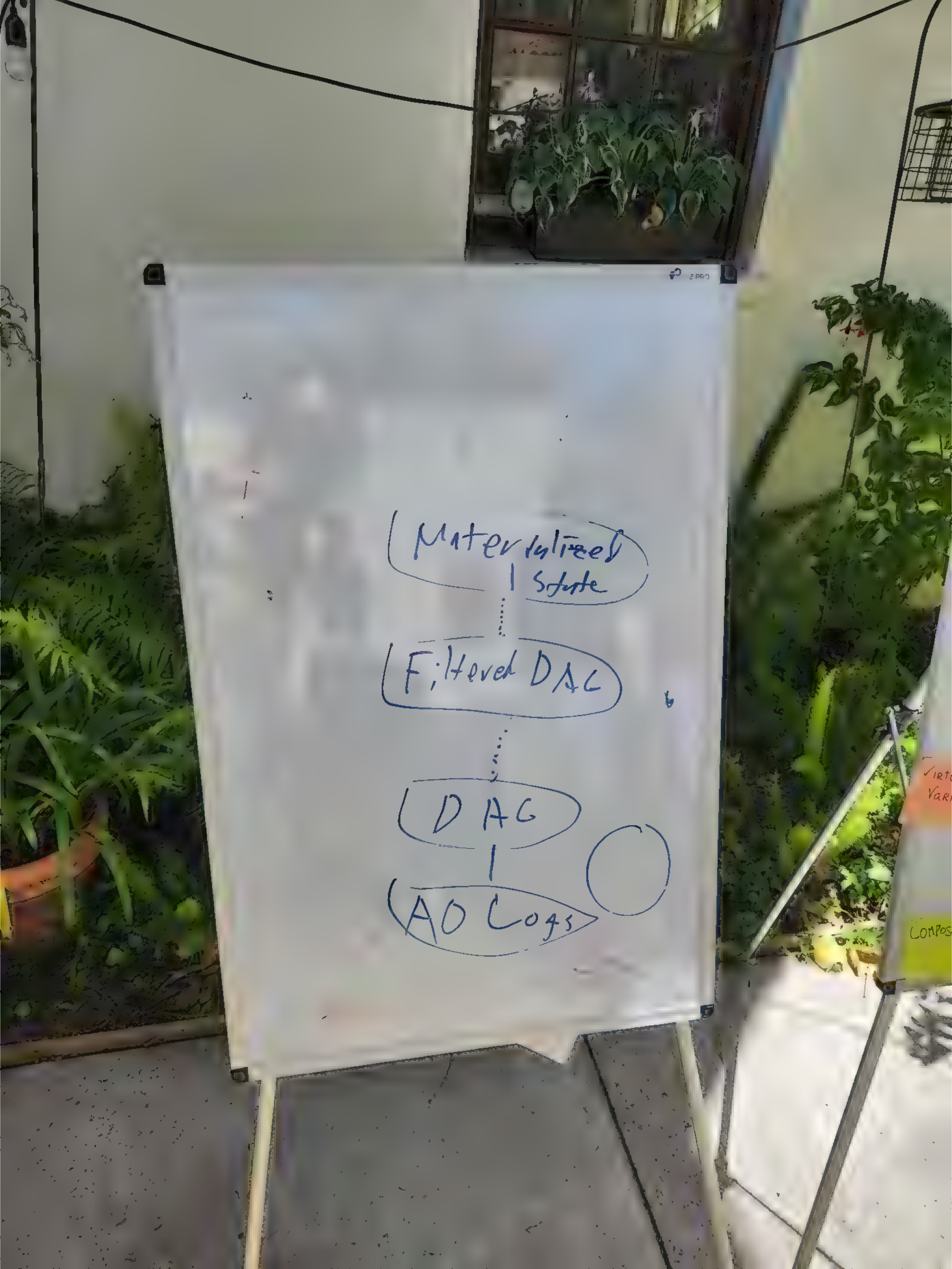
THURSDAY

- iroh- brendan


The User
Is Not
The OS
Is
Is
The Web Browser
Is Not
Is
Is Not
The Agent


DIDS
KEYS
ANON CREDENTIALS
LAMBDA
IRON TICKER
PRIVATE SET INTERSECTION
URI
PETNAMES
MDNS
HTTP GET /LIST
DIDS
Ambient Data
STURDY REF
RELAYS
MESSAGE QUEUES
PETICILLIUM (PROJECT)
PROXIES CONCEPT
MIXNETS
CHATS
SHELTER PROTO
PUB/SUB
APPEND ONLY
BLOCK CHAIN
PKI
TARGET A KEY ENCRYPT
SECRETS
AUTOM
CRDTS
CBLIV SYNC SERVICE
BITTORRENT
SHELTER PROTO
PROXY RE-ENCRYPT
CONTENT ADDRESSING
CACHING
MEMBRANE
DELEGATION
FILECOIN
REDUN CY
ERA ENCODI
OCAPN
OBJECT CAPABILITIE
KEY BASED IDENTITY
SELF PROVING DATA
ERASURE ENCODING
BITTORRENT
POWER IMBALANCE

SPLASH
2022


Materialized State
Filtered DAG
DAG
AO Logs

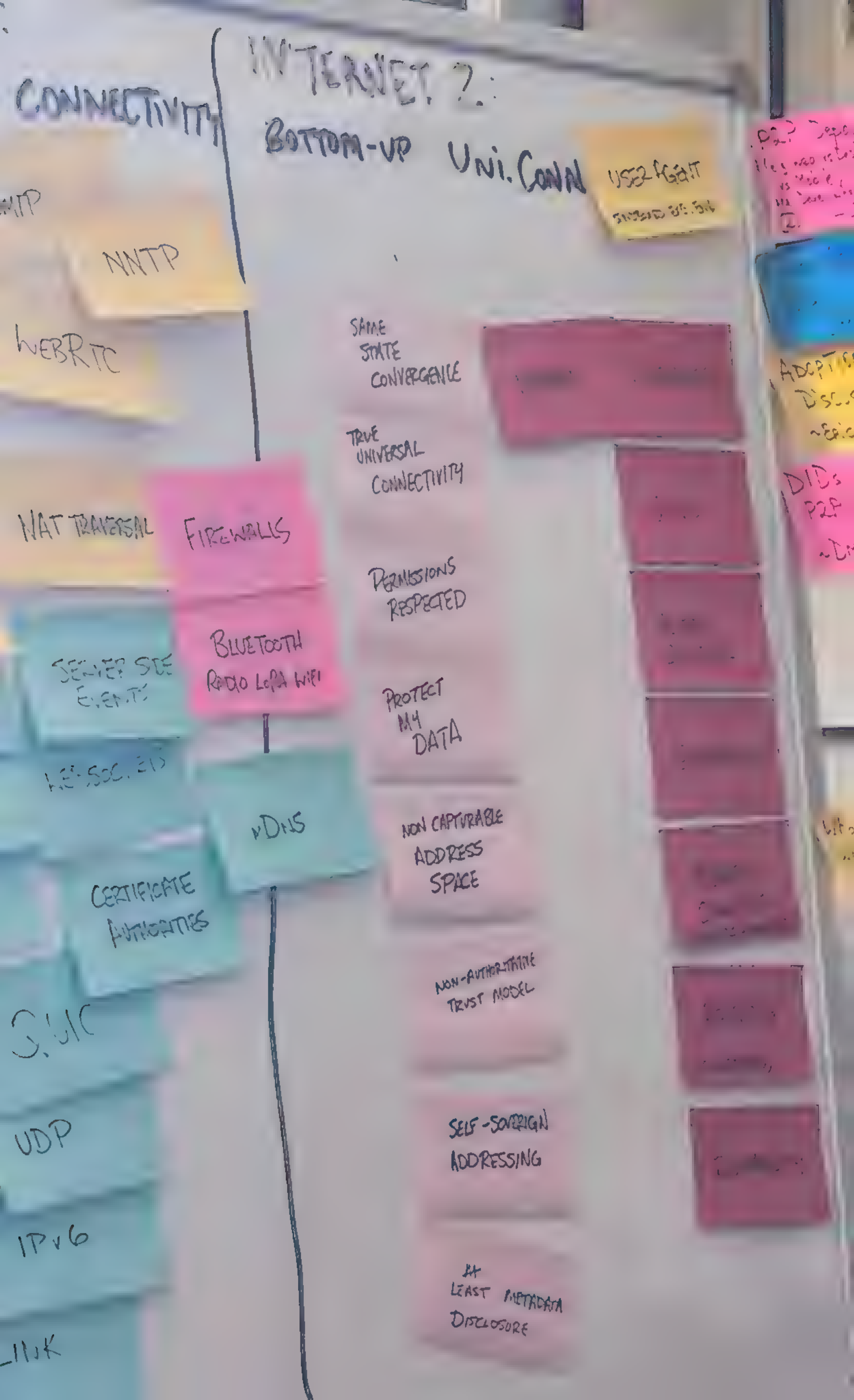
OK TU

CLOVER

Day 2 - Uncon[illegible] Seminar
2025
Ideas for sessions
Synthesis
Analysis

SISTER
FRYINGPAN
BLOODYW

EVERG


CONNECTIVITY
INTERNET 2:
BOTTOM-UP
UNI. COMM
USER AGENT
MTP
NNTP
WEBRTC
NAT TRAVERSAL
FIREWALLS
SERVER SIDE EVENTS
BLUETOOTH
RADIO LORA WIFI
WEBSOCKETS
vDNS
CERTIFICATE AUTHORITIES
QUIC
UDP
IPv6
LINK
SAME STATE CONVERGENCE
TRUE UNIVERSAL CONNECTIVITY
PERMISSIONS RESPECTED
PROTECT MY DATA
NON CAPTURABLE ADDRESS SPACE
NON-AUTHORITATIVE TRUST MODEL
SELF-SOVERIGN ADDRESSING
LEAST METADATA DISCLOSURE
ADOPTI
DISC
DIDs
P2P

CHAMPION 27 TON
27 TON

CHAMPION
POWER EQUIPMENT
27 TON
27 TON
CHAMPION

Paul's
honey 2023
Ball
SureTight
Honey 540R
July 2024
Ball
SureTight

SWITZERLAND

Plum
Mitchell's
ICE CREAM
SAN FRANCISCO
Mitchell's
Mitchell's
ICE CREAM
Cuisinart

Panasonic

ILLUMINATIONS
ARTISTS OTHERS
MAKE INK

SISTER
FRYINGPAN

THE WELL TEMPERED CLAVIER

Decentralized Collaboration

Q: Is this a CRDT?

A: Yes, non-server reconciliation always is. See OpSets.

No insert after <id>" ops

→ ve text editing!

IDLES
ROCK FOR SOFTIES
CHARLIES ACRES

IDLES
ROCK FOR SOFTIES
CHARLIE'S ACRES

IDLES
ROCK FOR SOFTIES
CHARLIE'S ACRES

IDLES
CHARLIES ACRES

IDLES
ROCK FOR SOFTIES

IDLES
CHARLIES ACRES

THURSDAY NIGHT
BLOODYWOOD

BLOODYWOOD

THURSDAY
BLOODYWOOD

ILLO'S
PICKLES
Spears

BLOODYWOOD

Session Slot

[illegible]

"All you need is IPv6"?
~14
~ nanomonkey

②
[illegible] Modeling/
[illegible]
~ [illegible] ⑪

③
P2P User Agents Gallery + Dev Api
~ Dave
15

Synchroniz'n Gallery ⑤
~ Christian

LUNCH

UI for
~

Key Rotation

Deferred Conflic Resolu
~ Sant

Collaborative Data Model Requirements
~ Eric + Andreas

Shared P2P & System Layer/ Infra.
⑥
~ Andreas

Broadcast over Memory Channels
⑥ ~ Christian

Session Slot

[illegible]

"All you need is IPv6"?
- nanomonkey ~14

2

Threat Modeling / Privacy Invariants
- YingTong (11)

3

P2P User Agents Gallery + Dev Api
~ Dave

Synchronizin Gallery (5)
- Christian

LUNCH

UI for
- r

Key Rotation

Deferred Conflic Resolu
~ Sant

Collaborative Data Model Requirements
- Andreas + Eric

Shared P2P System Layer/ Infra.
(6) ~ Andreas

Broadcast over Memory Channels
(6) - Christian

CP
CAMPROS

CP
CAMPROS

LY!

FAT FREE MILK
CLOVER
FAT FREE MILK
LOUISIANA
CLOVER

2:36:08pm PT
DWeb Principles
01. Technology for human agency
02. Distributed benefits
03. Mutual respect
04. Humanity
05. Ecological imperatives
INTERNET ARCHIVE
ARCHIVE

love knows no limits
CALTECH ★ GAYPRIL ★ 2018
15-440
CARNEGIE MELLON UNIVERSITY

love
knows no limits
CALTECH ★ GAYPRIL ★ 2018
15-440
CARNEGIE MELLON UNIVERSITY
ll phone
50303

Ziploc
Ziploc
love knows no limits
15-440

INTERNET ARCHIVE
DWeb Principles
Session 1
Session
Session

DWeb Principles
01. Technology fo human agenc
02. Distributed benefits
03. Mutual respect
04. Human
cal tives
INTERNET ARCHIVE
INTERNET ARCHIVE

	Room #1	Room #2	Room #3	Room #4	Room #5
Session 1 (11:15a - 12:00p)	P2P System Architecture + Terminology - Duke	P2P vs. Power Imbalance - Dave & Eric			
Session 2 (2pm - 2:45pm)	a P2P Threat Modeling Hypercube - Ying Tong	Data Structures for P2P Apps - Santiago			
Session 3 (3:30pm - 4:15)	a P2P Syllabus/Textbook Structure - Christian	Delphi Session on P2P - Duke			

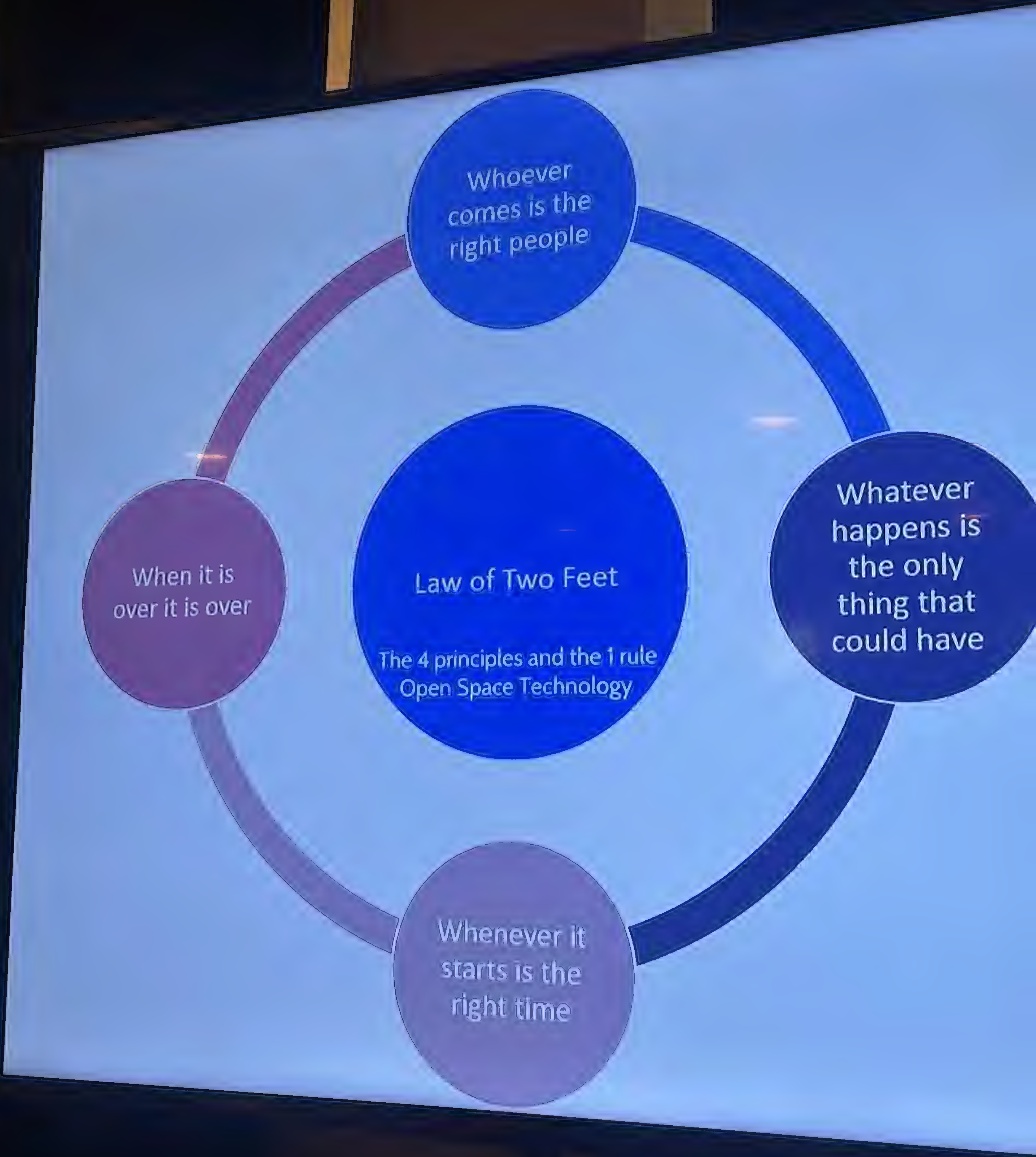
02.
Distributed benefits
The Web is most beneficial when rewards and recognition are shared.

DWeb Principles
01. Technology for human agency
02. Distributed benefits
ERNET ARCHI

02.
Distributed benefits
04.
Humanity
INTERNET ARCHIVE
ARCHIVE

02.
Distributed benefits
The Qweb is most beneficial when rewards and recognition are shared.

DWeb Principles
01. Technology for human agency
02. Distributed benefits
04. Humanity
INTERNET ARCHIV



Whoever comes is the right people

Whatever happens is the only thing that could have

Whenever it starts is the right time

When it is over it is over

Law of Two Feet

The 4 principles and the 1 rule Open Space Technology

03.
Mutual
respect
istribute
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Web
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UC IRVINE
Micah
Matt

02.
Distrib
benef
03.
Mutual
respect
UC IRVINE

UC IRVINE
Web
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fits
03

UC IRVINE
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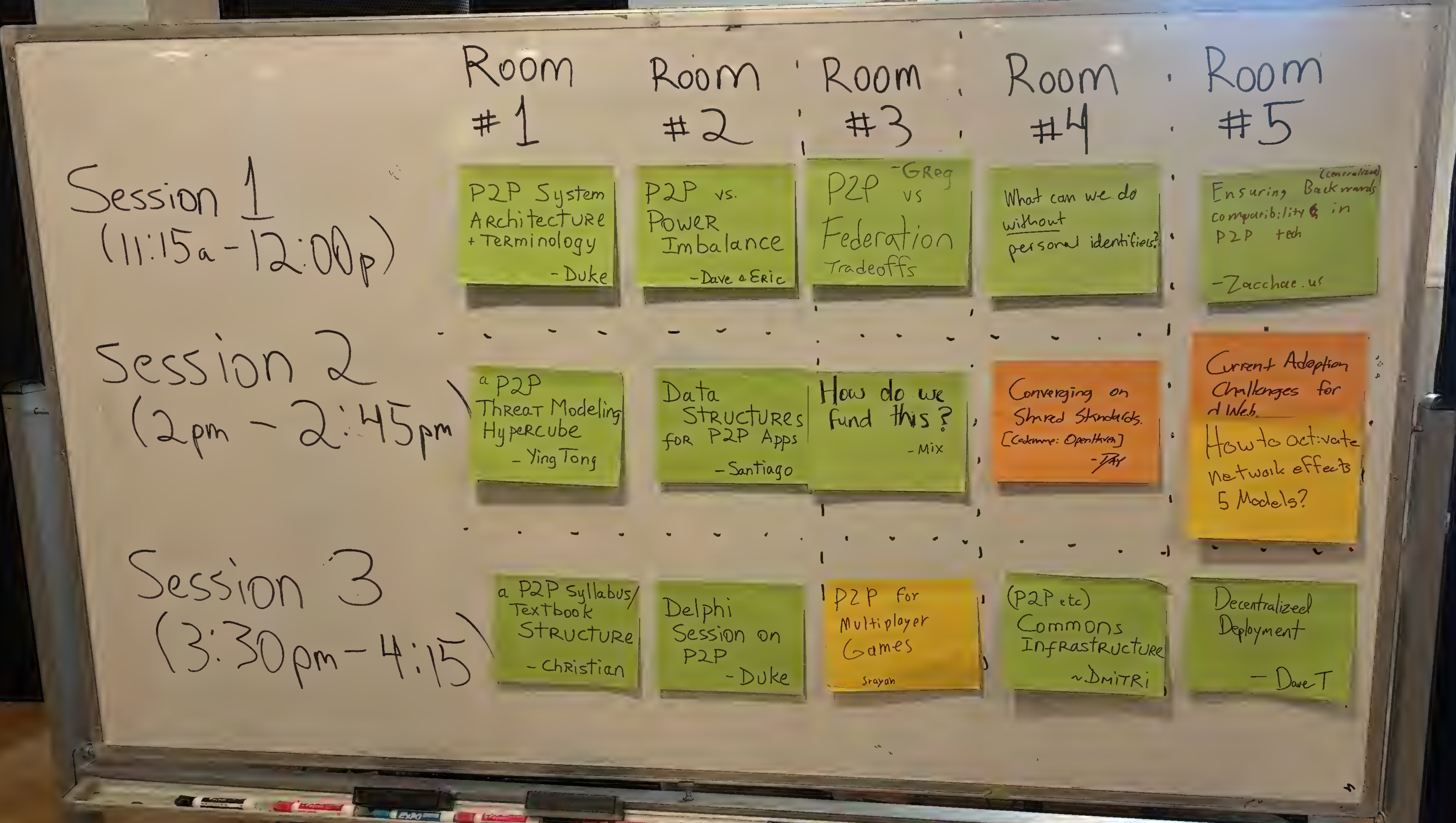
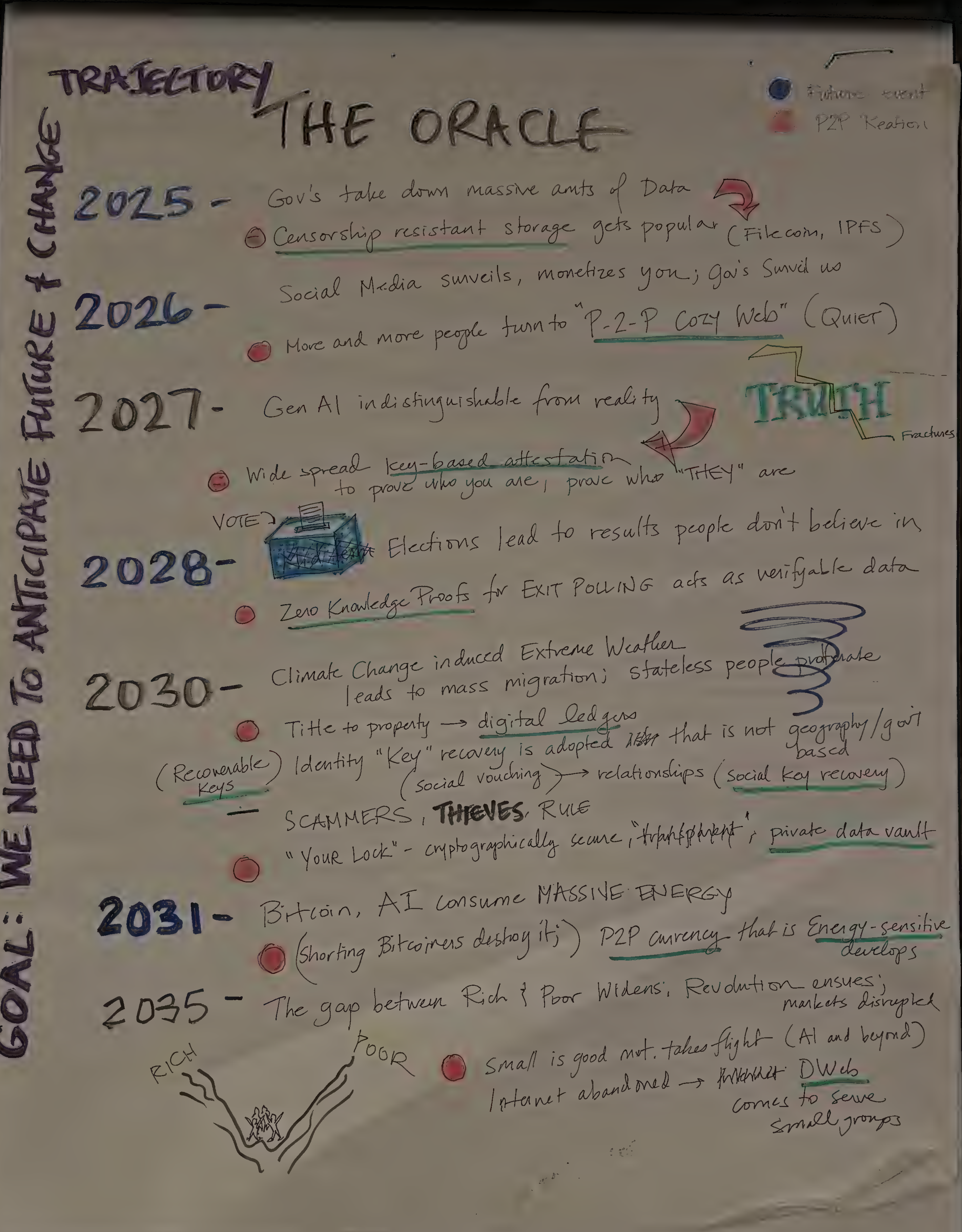
INTERNET
ARCHI

INTERNET ARCHIVE



	Room #1	Room #2	Room #3	Room #4	Room #5
Session 1 (11:15a - 12:00p)	P2P System Architecture + Terminology - Duke	P2P vs. Power Imbalance - Dave & Eric	P2P vs Federation Tradeoffs - Greg	What can we do without personal identifiers?	Ensuring (centralized) Backwards compatibility & in P2P tech - Zacchae.us
Session 2 (2pm - 2:45pm)	a P2P Threat Modeling Hypercube - Ying Tong	Data Structures for P2P Apps - Santiago	How do we fund this? - Mix	Converging on Shared Standards. [Codename: OpenHaven] - Jay	Current Adoption Challenges for d Web. How to activate network effects 5 Models?
Session 3 (3:30pm - 4:15)	a P2P Syllabus/ Textbook Structure - Christian	Delphi Session on P2P - Duke	P2P for Multiplayer Games Srayan	(P2P etc) Commons Infrastructure ~ Dmitri	Decentralized Deployment - Dave T



TRAJECTORY

THE ORACLE

🔵 Future event
🔴 P2P Reaction

GOAL: WE NEED TO ANTICIPATE FUTURE & CHANGE

2025 - Gov's take down massive amts of Data
🔴 Censorship resistant storage gets popular (Filecoin, IPFS)

2026 - Social Media surveils, monetizes you; Gov's Survil us
🔴 More and more people turn to "P-2-P Cozy Web" (Quiet)

2027 - Gen AI indistinguishable from reality

TRUTH
Fractures

🔴 Wide spread key-based attestation to prove who you are, prove who "THEY" are

VOTE

2028 - Elections lead to results people don't believe in
🔴 Zero Knowledge Proofs for EXIT POLLING acts as verifyable data

2030 - Climate Change induced Extreme Weather leads to mass migration; stateless people proliferate
🔴 Title to property → digital ledgers
(Recoverable Keys) Identity "Key" recovery is adopted that is not geography/gov't based (social vouching) → relationships (social key recovery)
— SCAMMERS, THIEVES, RULE
🔴 "YOUR LOCK" - cryptographically secure, ; private data vault

2031 - Bitcoin, AI consume MASSIVE ENERGY
🔴 (Shorting Bitcoiners destroy it;) P2P currency that is Energy-sensitive develops

2035 - The gap between Rich & Poor Widens; Revolution ensues; markets disrupted

RICH
POOR

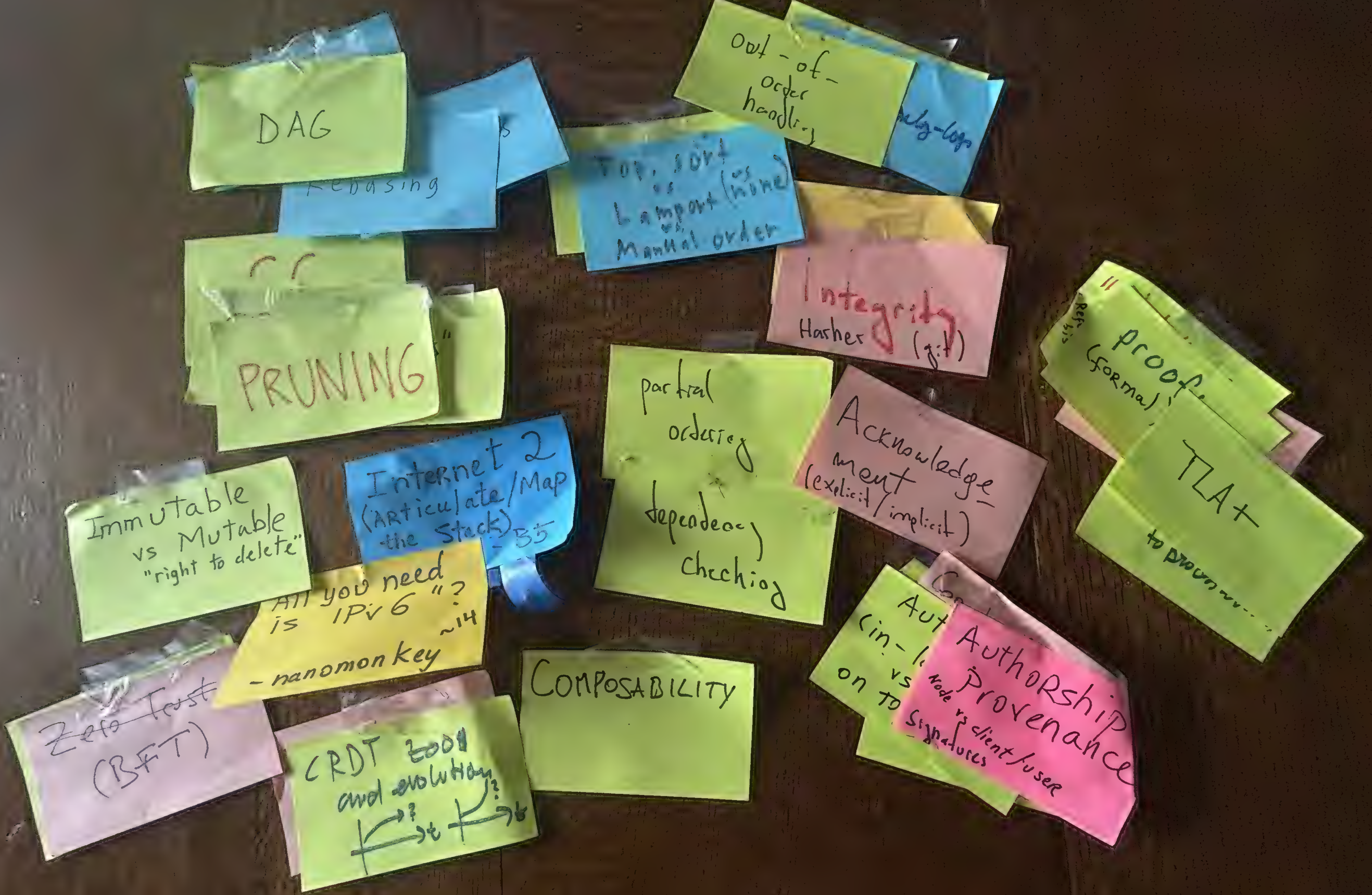
🔴 Small is good mvt. takes flight (AI and beyond)
Internet abandoned → DWeb comes to serve small groups

HOLOCHAIN
HYPERHYPER SPACE
AWARD OF MERIT
The Last Whole Earth Catalog
CHM
EDISON

Let's get this party started

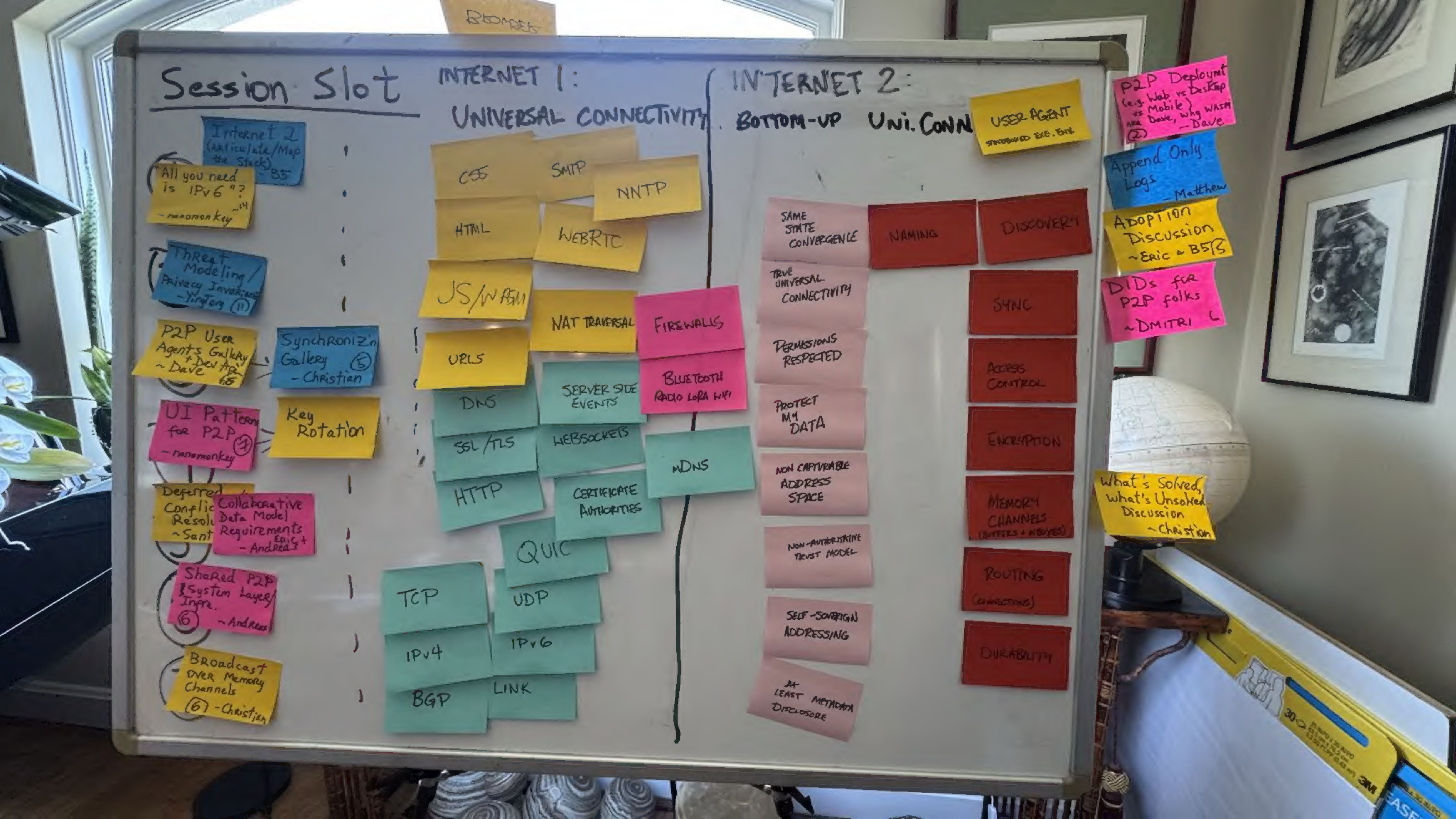
Let's get this party started

DAG
Rebasing
Out-of-order handling
Top. sort vs Lamport (vs time) vs Manual order
CC
PRUNING
integrity
Hasher (git)
Refs
proofs (formal)
TLA+
to prove…
partial ordering
dependency checking
Acknowledgement (explicit/implicit)
Internet 2 (Articulate/Map the Stack) ~35
Immutable vs Mutable "right to delete"
"All you need is IPv6"? ~14 - nanomonkey
Zero Trust (BFT)
CRDT 2008 and evolution
COMPOSABILITY
Aut… (in-l… vs on to…
Authorship Provenance
Node vs client/user
Signatures


DAG
Rebasing
GC
PRUNING
Out-of-order handling
-logs
Top. sort vs Lamport (vs none) vs Manual order
Integrity
Hashes (git)
proofs (formal)
Refs
TLA+
to proven...
partial ordering
dependency checking
Acknowledgement (explicit/implicit)
Immutable vs Mutable "right to delete"
Internet 2 (Articulate/Map the Stack) - BS
"All you need is IPv6"? ~14 - nanomonkey
~~Zero Trust~~ (BFT)
CRDT zoo and evolution
COMPOSABILITY
Aut (in-l vs on to
Authorship Provenance
Node vs client/user Signatures

alt school

alt school


BOOMER
Session Slot
INTERNET 1: UNIVERSAL CONNECTIVITY
INTERNET 2: BOTTOM-UP UNI. CONN
Internet 2 (Articulate/Map the Stack) - B5
"All you need is IPv6"? ~14 - nanomonkey
Threat Modeling/Privacy Invariants ~YingTong 11
P2P User Agents Gallery + Dev Apps ~Dave 15
Synchroniz'n Gallery 5 - Christian
UI Patterns for P2P 7 - nanomonkey
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CSS
SMTP
NNTP
HTML
WEBRTC
JS/WASM
NAT TRAVERSAL
FIREWALLS
URLS
BLUETOOTH RADIO LORA WIFI
DNS
SERVER SIDE EVENTS
SSL/TLS
WEBSOCKETS
mDNS
HTTP
CERTIFICATE AUTHORITIES
QUIC
TCP
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IPv4
IPv6
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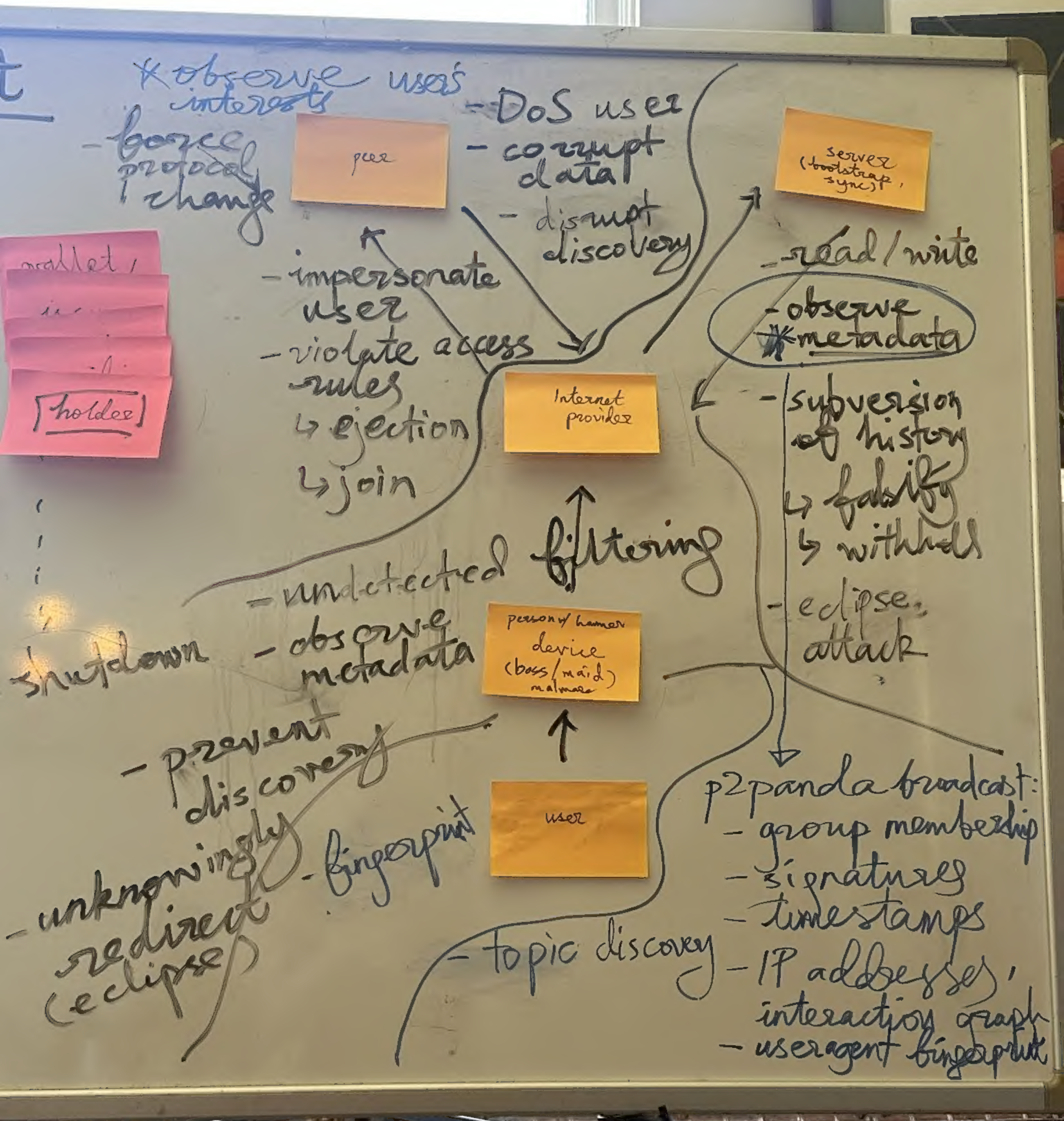
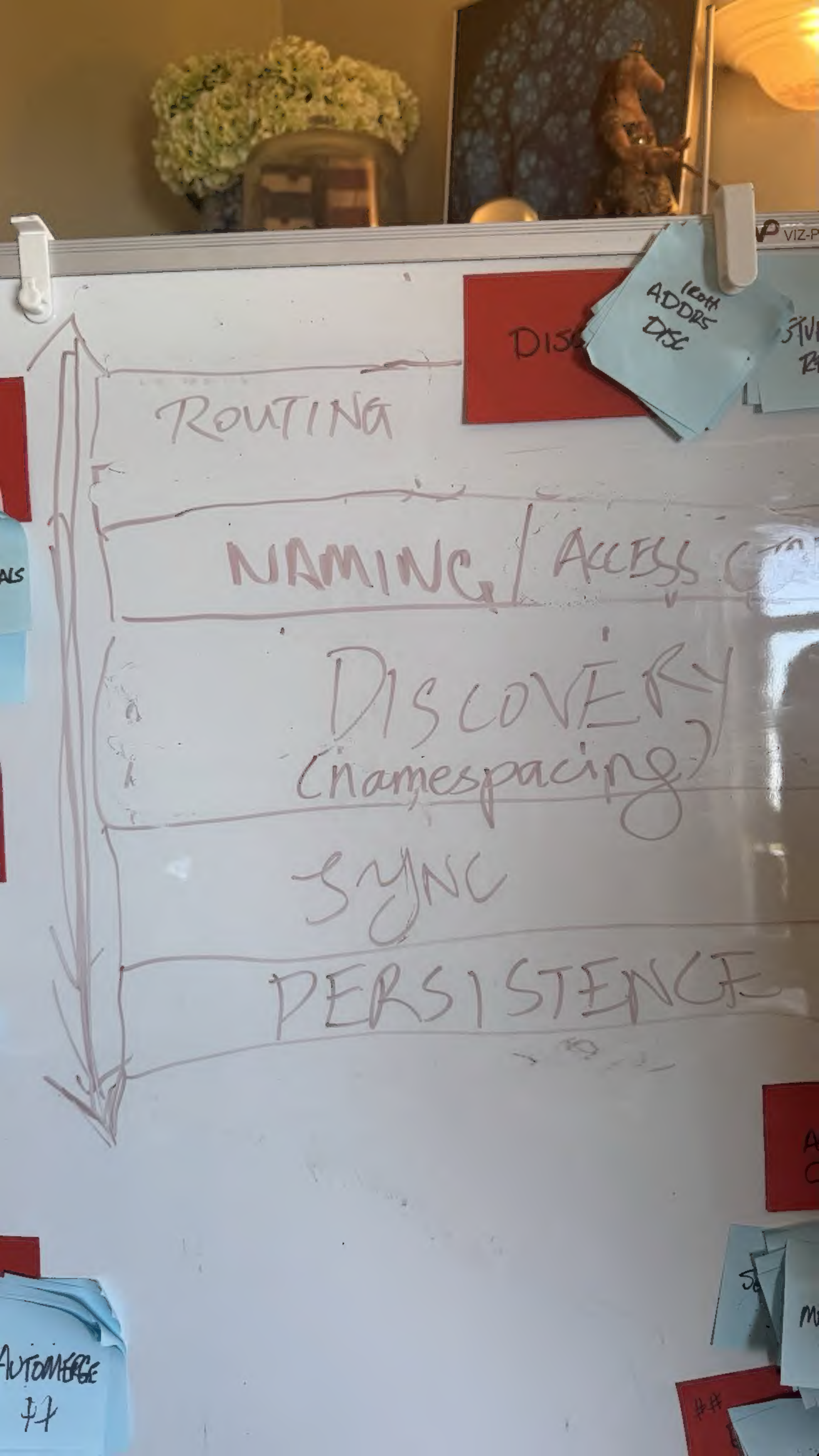
LINK
USER AGENT SANDBOXED EXE. ENV.
SAME STATE CONVERGENCE
TRUE UNIVERSAL CONNECTIVITY
PERMISSIONS RESPECTED
PROTECT MY DATA
NON CAPTURABLE ADDRESS SPACE
NON-AUTHORITATIVE TRUST MODEL
SELF-SOVERIGN ADDRESSING
AT LEAST METADATA DISCLOSURE
NAMING
DISCOVERY
SYNC
ACCESS CONTROL
ENCRYPTION
MEMORY CHANNELS (BUFFERS + INBOXES)
ROUTING (CONNECTIONS)
DURABILITY
P2P Deploymt (e.g. Web vs Desktop vs Mobile) aka Dave, why WASM 2 - Dave
Append Only Logs - Matthew
Adoption Discussion ~Eric & B5 5
DIDs for P2P folks ~DMITRI 6
What's Solved, what's Unsolved Discussion ~Christian


t
*observe user's interests
- force protocol change
peer
- DoS user
- corrupt data
- disrupt discovery
server (bootstrap, sync),
- read/write
- observe *metadata
- subversion of history
↳ falsify
↳ withhold
- eclipse attack
wallet
[holder]
- impersonate user
- violate access rules
↳ ejection
↳ join
Internet provider
filtering
- undetected
- observe metadata
shutdown
person w/ hammer
device (boss/maid) malware
- prevent discovery
- unknowingly redirect (eclipse)
- fingerprint
user
- topic discovery
p2panda broadcast:
- group membership
- signatures
- timestamps
- IP addresses, interaction graph
- useragent fingerprint


DIS
IROH
ADDRS
DISC
ROUTING
NAMING / ACCESS C
DISCOVERY
(namespacing)
SYNC
PERSISTENCE
AUTOMERGE
#7